

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

Amendment to the Drawings

The attached Replacement Sheet includes a corrected drawing sheet which labels Figure 1 as Prior Art.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

REMARKS

The non-final Office Action mailed January 5, 2011 has been reviewed and carefully considered. Claims 1-9 are pending in this application. Claims 1, 2, 4, 5 and 7-9 have been amended. Claims 10 and 11 are newly added claims. No new matter has been added. Reconsideration of the above-identified application is respectfully requested in view of the following remarks.

Objection to the Abstract

The Examiner has objected to the Abstract of the present application stating that the Abstract should be limited to one paragraph. The amended abstract provided above corrects this error. Applicants request that the originally filed Abstract be replaced with the amended Abstract as shown above, and that this objection be withdrawn.

Objection to the Specification

Applicants' have amended the paragraph at page 9, lines 21-26 of the originally filed application to account for a translation error. No new matter has been added by this amendment.

The word "niveaus" of the French text in the corresponding International application was inadvertently translated as "networks" in the present application. However, the proper translation of the term "niveaus" is actually "levels". Hence, the amended paragraph in the present application explains that the motion configuration choice circuit described therein receives "temporal decomposition levels", rather than "temporal decomposition networks". Therefore, Applicants request that the paragraph at page 9, lines 21-26 of the originally filed application be replaced with the amended paragraph provided above.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

Objection to the Drawings

The Examiner has objected to Figure 1 stating that this drawing should be labeled as "Prior Art". A Replacement Sheet is attached to this response in which Figure 1 is labeled as "Prior Art". Accordingly, withdrawal of this objection is respectfully requested.

Objection to the Claims

Claims 2 and 4-9 stand objected to for including informalities.

With respect to claim 2, the Examiner argues that the phrase "the interpolation filter" is unclear. Claim 2 has amended such that the phrase "the interpolation filter" has been replaced with "the spatial interpolation filter" as indicated in the claim listing provided above.

With respect to claim 4, the Examiner argues that the phrase "the said spatial resolution" is unclear, and suggests that the word "said" be removed. Applicants have amended claim 4 to comply with the Examiner's recommendation.

Claims 5, 6, 8 and 9 stand objected to based upon their dependency from claim 4.

In view of the amendments to claims 2 and 4, Applicants request that the above objections be withdrawn.

Rejection of Claim 8 under 35 U.S.C. § 112

Claim 8 stands rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Specifically, the Examiner argues that the phrase "the temporal analysis circuit" lacks sufficient antecedent basis.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

Claim 8 has been amended such that the phrase "the temporal analysis circuit" has been replaced with "a temporal analysis circuit". Accordingly, Applicants request withdrawal of this rejection.

Rejection of Claims 1 and 3-6 under 35 U.S.C. § 102(e)

Claims 1 and 3-6 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. 2006/00080000 to Ye et al. (hereinafter "Ye").

Initially, it is pointed out that independent claims 1 and 4 have been amended. In particular, independent claim 1 has been amended, *inter alia*, to recite the following:

Decoding method of a picture sequence coded with spatial and temporal scalability, the coded data comprising motion information, the method comprising a hierarchical temporal synthesis step carrying out a motion compensated temporal filtering, or MCTF, of pictures at a frequency decomposition level of the motion information, to provide pictures at a lower decomposition level, wherein the hierarchical temporal synthesis step comprises a motion estimation step using spatial interpolation filters and wherein, during a motion compensated temporal filtering operation, the resolution chosen for the use of the motion information and the complexity of the spatial interpolation filters used for the motion estimation are controlled by a motion configuration choice circuit and depend on a decoding scenario, or else the temporal decomposition level corresponding to the pictures, or a combination of these parameters, wherein the decoding scenario depends on spatial or temporal resolutions and a bit-rate selected for the decoding.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

Similarly, independent claim 4 has been amended in a similar manner and recites the following:

Coding method of a picture sequence of a given spatial resolution, with spatial and temporal scalability, comprising a hierarchical temporal analysis step carrying out a motion compensated temporal filtering, or MCTF, of pictures at a frequency decomposition level, from motion information obtained by a motion estimation step performed between these pictures, to provide pictures at a higher decomposition level, wherein, during a motion compensated temporal filtering operation, the resolution chosen for the use of the said-motion information and the complexity of the interpolation filters used depends upon the said given spatial resolution of the source pictures or the corresponding temporal decomposition level, and wherein said motion estimation step comprises a first motion configuration choice for determining operating conditions of the motion estimation according to different decomposition levels of pictures received from the hierarchical temporal analysis step, and wherein said hierarchical temporal analysis step comprises performing a motion compensation and further comprises performing a second motion configuration choice for determining a configuration of said motion compensation according to the decomposition levels of the pictures or said given spatial resolution.

Support for the above-identified elements in independent claims 1 and 4 can be found at least at page 2, lines 1-11; page 2, lines 28-32; page 3, lines 12-16; page 4, line 24 – page 5, line 5; page 6, lines 4-6; page 7, line 33 – page 8, line 31; and page 9, lines 33-37 of the originally filed application. No new matter has been added by these amendments.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

With respect to amended claim 1, it is respectfully asserted that the Ye at least fails to teach or suggest the following elements in this claim:

...during a motion compensated temporal filtering operation,... the complexity of the spatial interpolation filters used for the motion estimation are controlled by a motion configuration choice circuit...

As indicated above, amended claim 1 recites a motion configuration choice circuit which controls the "the complexity of the spatial interpolation filters used for the motion estimation" during a motion compensated temporal filtering operation. After a careful review of Ye, Applicants respectfully assert that this reference fails to teach or suggest anything with respect to controlling the complexity of the spatial interpolation filters used for motion estimation.

In rejecting previously presented claim 1, paragraphs [0030], [0035] and [0040] of Ye were cited as disclosing similar elements which relate to controlling the complexity of the interpolation filters used for motion estimation. Applicants respectfully assert that the above-identified elements are not disclosed or suggested by Ye.

Ye relates to "overcomplete wavelet coding using adaptive motion compensated temporal filtering" (Ye: paragraph [0002]). The previously cited passages explain that the video coder therein includes a motion compensated temporal filtering (MCTF) unit which comprises a motion estimator and a temporal filter. However, neither the cited passages, nor any other passage in this reference, teaches or suggests that the motion estimator (or any other component for that matter) described in this reference can control the complexity of a "spatial interpolation filter" which is used for motion estimation, or that the complexity of a spatial interpolation filter is controlled by a "motion configuration choice circuit" as recited in claim 1.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

Applicants' specification explains that the present principles address a number of problems associated with the prior art coding schemes. For example, it is explained that conventional coders tend to degrade the quality of a picture when the picture resolution becomes small with respect to the size of the interpolation filters used for motion compensation (Applicants' Specification: page 1, lines 26-34). This may be due to the fact that motion compensation is applied uniformly in these codes regardless of the picture size or bit-rate of the video to be decoded. The present principles address this issue, at least in part, by accounting for the complexity of the spatial interpolation filter used in motion compensation. However, since Ye does not address the above problem, it follows that this reference fails to contemplate the control over spatial interpolation filters used for motion compensation.

In addition, Applicants point out that while cited paragraph [0040] provides a discussion with regard to "the complexity scalability of the decoder" therein, this passage does not in provide any discussion with regard to controlling the complexity of spatial interpolation filters. In other words, although Ye may explain that the coding scheme therein provides for a decoder which is scalable in terms of complexity, this is entirely different from the elements in claim 1 which relate to providing a coding scheme which controls the complexity of spatial interpolation filters used in estimating motion in pictures.

Even further, since Ye fails to teach or suggest anything with respect to controlling the complexity of interpolation filters used for motion estimation, it logically follows that this reference further fails to teach or suggest that controlling the complexity of these filters "depend[s] on a decoding scenario, or else the temporal decomposition level corresponding to the pictures, or a combination of these parameters, wherein the decoding scenario depends on spatial or temporal resolutions and a bit-rate selected for the decoding" as also recited in claim 1.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

As indicated by the above elements, claim 1 recites that the manner in which the complexity of the spatial interpolation filters is controlled depends on either a "decoding scenario", "temporal decomposition level corresponding to the pictures" or a combination of these two factors. Moreover, claim 1 explicitly recites that the "decoding scenario" involves consideration of both the spatial/temporal resolutions and the bit-rate which are selected for decoding purposes.

Ye teaches little if anything with respect to controlling the complexity of the spatial interpolation filters which are used for motion estimation. Thus, it can hardly be argued that this reference discloses the particular manner of controlling the complexity of such filters as recited in the present claims which involves consideration of the decoding scenario which will subsequently be applied to the pictures (i.e., the spatial/temporal resolutions and the bit-rate which will be applied during decoding), or the temporal decomposition level which is associated with the pictures.

Accordingly, for at least the reasons explained above, Ye fails to teach or suggest all the elements recited in claim 1, and the rejection of this claim is believed improper for at least this reason.

With respect to amended claim 4, it is respectfully asserted that Ye at least fails to teach or suggest the following elements recited in this claim:

... wherein said motion estimation step comprises a first motion configuration choice for determining operating conditions of the motion estimation according to different decomposition levels of pictures received from the hierarchical temporal analysis step, and wherein said hierarchical temporal analysis step comprises performing a motion compensation and further

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

comprises performing a second motion configuration choice for determining a configuration of said motion compensation according to the decomposition levels of the pictures or said given spatial resolution.

As indicated above, claim 4 recites a "first motion configuration choice" or the "second motion configuration choice". The first motion configuration choice determines the operating conditions of the motion estimation according to different decomposition levels of pictures, while the second motion configuration choice determines the configuration of the motion compensation according to either the decomposition levels of the pictures or a given spatial resolution.

After reviewing Ye, Applicants respectfully assert this reference fails to teach or suggest anything which is even remotely related to the "first motion configuration choice" or the "second motion configuration choice" features recited in the present claims. The motion estimator in Ye does not determine the operating conditions associated with motion estimation or determine the configuration of the motion compensation in the manner recited in claim 4. In fact, this reference fails to teach or suggest anything of the sort. Therefore, for at least the above reasons, Ye fails to teach or suggest all the elements recited in claim 4, and the rejection of this claim is believed improper for at least this reason.

All remaining claims depend from either claim 1 or claim 4, or a claim which itself is dependent from one of these claims. Accordingly, all remaining claims are patentably distinct over the cited references for at least the reasons set forth above. Thus, reconsideration of this rejection is respectfully requested.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

Rejection of Claims 2, 7 and 9 under 35 U.S.C. § 103(a)

Claims 2, 7 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ye in view of U.S. Patent No. 7,349,473 to Hallapuro et al. (hereinafter "Hallapuro"). Applicants respectfully traverse this rejection.

For at least the reasons discussed above, claims 1 and 4 are believed to be patentable and non-obvious over Ye. Claims 2, 7 and 9 depend from either claim 1 or 4 and thus include all of the elements set forth in these claims. Since Hallapuro fails to cure the deficiencies of Ye with respect to the above-identified elements in claims 1 and 4, the present rejection is believed improper.

Hallapuro relates to a system of compression of sequences of digital images (Hallapuro: col. 1, lines 11-13). However, like Ye, this reference fails to teach or suggest anything with respect to controlling the complexity of the spatial interpolation filters used for motion estimation, and certainly fails to teach or suggest that said control depends on either a decoding scenario, a temporal decomposition level of associated pictures or a combination of these two factors as recited in claim 1. Likewise, Hallapuro further fails to teach or suggest anything with respect to providing a first motion configuration choice which determines the operating conditions of the motion estimation according to different decomposition levels of pictures, or with respect to a second motion configuration choice which determines the configuration of the motion compensation according to either the decomposition levels of the pictures or a given spatial resolution as recited in claim 4. Therefore, claims 2, 7 and 9 are believed to be patentable over the cited combination of Ye and Hallapuro for at the reasons discussed above.

Reconsideration of this rejection is respectfully requested.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

New Claims

Claims 10 and 11 are newly added claims. Support for the subject matter in these claims can be found at least at page 2, lines 13-17 of the originally filed application.

Dependent claim 10 recites "...wherein a number of coefficients used by the interpolation filter for motion compensation depends on the decoding scenario or the temporal decomposition level."

Dependent claim 11 recites "...wherein the hierarchical temporal synthesis block comprises a motion compensation filter for decoding wavelet coefficients."

These claims recite subject matter which is neither taught nor suggested by the cited references, and which render these claims patentable over the cited references for additional reasons. Accordingly, Applicants respectfully request allowance of these claims, in addition to all other claims pending in this case.

Customer No. 24498
Attorney Docket No. PF040032
Office Action Date: 1/5/11

Conclusion

In view of the foregoing, Applicants respectfully request that the rejection of claims 1-9 set forth in the Office Action of January 5, 2011 be withdrawn, that pending claims 1-11 be allowed, and that the case proceed to issuance of Letters Patent in due course.

It is believed that no additional fees or charges are currently due. However, in the event that any additional fees or charges are required at this time in connection with the application, they may be charged to Account No. 07-0832.

Sincerely,

Dated: 4/4/11

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